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ABSTRACT

The impact of growing numbers of personal computers at Dartmouth College was assessed. During one academic year (1984-1985), the number of personal computers (mostly Macintoshes) grew from less than 50 to almost 2,000. The assessment focused on three areas: purchase and admissions data, student life, and the curriculum. Tentative findings include: blacks and females bought Macintoshes at significantly lower rates than did whites and males. These same groups also made less use of other campus computing resources. Students who purchased Macintoshes had higher quantitative scores on the Scholastic Aptitude Test (SAT) than nonbuyers but there were no differences in verbal SAT scores. Students seemed to like their Macintoshes; they used them primarily for word processing and they believed that their performance had improved by having one. Student communications improved greatly as a result of the personal computers. Faculty and students felt generally positive about the effect of the Macintoshes on the curriculum, but there was no evidence that the amount of learning had increased in courses using the computers. Statistical findings and the study questionnaire are appended. (SW)

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Abstract

During the academic year 1984/85, the number of personal computers on campus jumped from less than 50 to almost 2000. A committee was formed to examine the impact of that change at Dartmouth. We concentrated on three areas: purchase and admissions data, student life, and the curriculum. It will require a few years to be confident of any lasting impact but a few tentative findings are beginning to emerge. Most of them warrant further study before arriving at any firm conclusions. Some of those findings are: Blacks and females bought Macintoshes at significantly lower rates than did whites and males. These same groups also make less use of other campus computing resources. Students who purchase Macintoshes have higher SAT quantitative scores than non-buyers but there are no differences in verbal SAT scores. If this trend continues, we may see a change in the nature of the student body toward the quantitative end of the spectrum. Students appear to like their Macintoshes; they use them primarily for word processing; and, they believe that their performance has improved by having one. Student communications have improved greatly as a result of the personal computers. Faculty and students feel generally positive about the effect of the Macintoshes on the curriculum, but there is no evidence to date that the amount of learning has increased in courses using the computers.

The Impact of the Macintosh at Dartmouth

During the academic year 1983/84, Dartmouth decided to mount an intensive effort to provide students and faculty with access to personal computers. We negotiated with various computer manufacturers to put together a computer package that would be powerful, useful, and affordable. The trustees felt that such a package should not cost the students significantly more than $1000. Three possible computers were considered: the Macintosh from Apple, the PC Junior from IBM, and the Rainbow from DEC. The Macintosh was chosen and Dartmouth became a charter member of the Apple University Consortium.

Dartmouth with the help of Apple began to provide professors with Macintoshes and Lisas late in that academic year. Eventually the college made154 Macintoshes and 14 Lisas available to the faculty. Several other faculty members purchased their own Macintoshes and/or printers. In addition a professional software group was formed to work with the faculty in developing curricular software. These efforts were aided by grants from Apple and the Alfred P. Sloan Foundation.

At the beginning of the Fall term 1984, a computer package was made available to the students. The package consisted of the Macintosh and several pieces of software: MacWrite, MacPaint, a communications package, a programming language and cables. (The distribution of the programming language was delayed for a year due to lack of availability.) The package was priced at $1265. Freshmen were strongly encouraged to buy the computer and were permitted to include it in their financial aid package. The cost of the computer could be spread across their four years. Upperclassmen were also encouraged to buy the computer but had to pay for it in one payment and could not include it in their financial aid.

In a parallel effort, all of the campus dormitories were hard-wired so that every room was connected to the campus network and the central time-sharing system. The students were, therefore, able to use their Macintoshes as stand-alone computers or as terminals to communicate with the campus network. We believe that Dartmouth was the first college in the country to connect all of the dormitory rooms to the main campus computer system. Part of the cost of wiring the dorms was provided by the Pew Memorial Trust. (Most of the academic and administrative buildings had previously been hard-wired to the central system.)

During that first year about 2 out of every 5 students purchased Macintoshes. A total of 1649 Macintoshes were bought. This included 80% of the freshman class. About 1% of the Macintoshes had 512k of memory; the rest had 128k. Over one-half of those purchasing Macintoshes also purchased printers, the Imagewriter. This last figure was higher than expected. See Table 1 for complete details on student purchases.

TABLE 1
Computer Purchases by Students for the Academic Year 1984/85

Item	Class 1984	1985	1986	1987	1988	Totals
Macintosh 128k	19	242	216	360	805	1642
Macintosh 512k	0	8	3	4	2	17
Lisa 2	1	0	0	0	0	1
ImageWriter	16	155	135	205	415	926
Qume Printer	0	7	1	1	1	10
Extra Disk Drive	2	37	17	12	61	129
Expansion Kit (512)	0	4	1	3	3	11
Numeric keypad	1	14	9	18	37	79

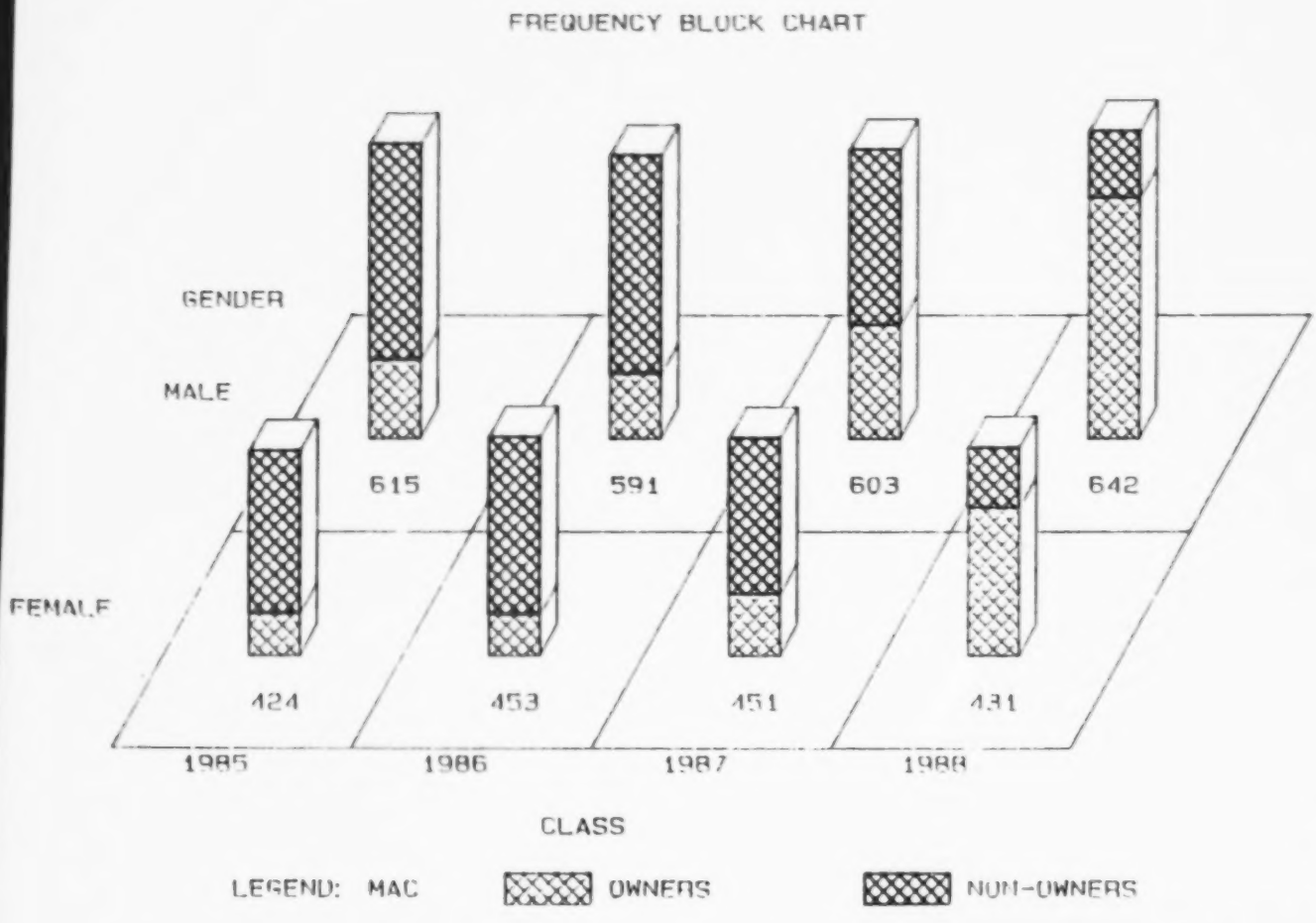
In one year, therefore, Dartmouth moved from a college where there were about 50 personal computers to one where there were almost 2000 personal computers and most of them were connected to the central time-sharing system. We felt that a change of this magnitude should be studied. An ad hoc committee was formed to evaluate the impact of the Macintosh at Dartmouth. The committee decided to focus on three main areas: archival data, student life, and the curriculum. By archival data, we mean an analysis of existing data on who applies to Dartmouth, who is admitted, who buys computers, what courses they take, etc. With the intensification of computing, we wanted to see what effect it would have on the admission process. In the area of student life, we were interested in what impact the Macintoshes might have on such things as dorm life, student interactions, etc. and what the students were doing with their Macintoshes and what they thought of them. To obtain data on these questions, we met with several student groups and surveyed a random sample of students. Finally, we wanted see what was being done with the Macintoshes in the curriculum and what effect, if any, they were having.

Main Findings from Archival Data

1. Males were significantly more likely to buy Macintoshes than females. Overall 42% of the males on campus purchased a Macintosh but only 34% of the females purchased Macintoshes (see Figure 1). Given the purchase of a Macintosh, females were as likely as males to buy a printer. About 56% of the Macintosh buyers of each sex also purchased a printer.

FIGURE 1

Number of Macintosh Owners as a Function of Class and Gender



2. Black students were significantly less likely than any other group to have purchased a Macintosh or a printer. 40% of white students purchased Macs but only 27% of black students. Other minority groups (Oriental, Native American, and Hispanic) purchased Macintoshes at even higher rates than white students, but the number of students is these categories is small (see Figure 2). Black students were also very unlikely to purchase printers. Among those black students who purchased a Macintosh only about 25% bought a printer.

3. Macintosh buyers had similar verbal SAT scores to non-buyers but Macintosh buyers had higher quantitative SAT scores, suggesting that Dartmouth might attract more quantitatively oriented students in the future.

4. This year (1985/86) 70% of the freshman bought Macintoshes, half of those bought printers, and 51% of the Macintoshes were fat. Even though some freshman did buy Macintoshes after the start of the year, we believe that the decrease from last year to this year is real.

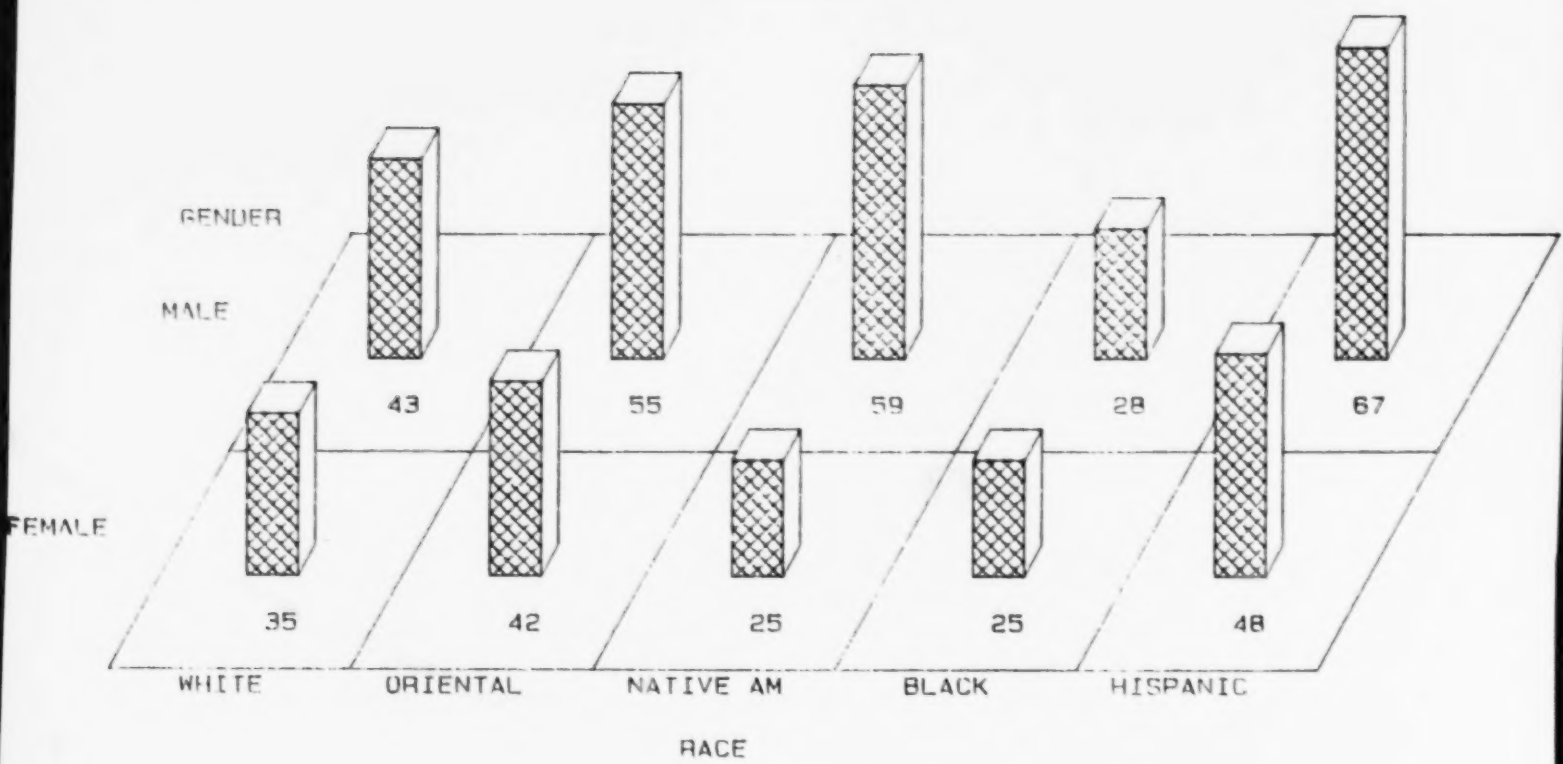
We believe that the differential purchase rate across race and sex should be monitored and examined. It is not necessarily a bad thing to choose not to purchase a Macintosh. It might, however, be cause for concern if lack of financial resources were at fault. Three bits of data suggest that financial resources were not the sole cause of racial differences in purchases. Firstly, the computer could be included in the financial aid package. Secondly, Native Americans and Hispanics did purchase Macintoshes in above average numbers and their financial background is roughly similar to the black students. Finally, we analyzed use of the central time-sharing system by Macintosh owners and nonowners of each race. Black students of either category use the time-sharing system far less than the other students and those resources are free. In any case, we believe that these statistics should be monitored on an annual basis.

One other statistic deserves some note. Applications for admission to the class of 1989 were at a record high (9213). We have no evidence that the renewed emphasis on computing had any bearing on this. In fact, in our survey of the class of 1988, they claimed that the availability of Macintoshes had played little or no role on their decision to apply or accept. The decision to purchase Macintoshes and the resulting PR probably came too late to affect the class of '88. The class of '89 should be surveyed to assess the impact of the Macintosh on their decision to apply and accept and we need to analyze data from comparison schools to determine whether the presence of Macintoshes had any bearing on our record applications this past year.

FIGURE 2

Percentage of Macintosh Owners as a Function of Race and Gender

Percentage Bar Chart



Chi-Square Analyses Indicate Significant Effects for both Race and Gender

Main Findings from Student Data

1. The quality of student communications improved substantially. Dorm, sorority, and fraternity newsletters were done on time and vastly improved. Party announcements are now works of art. etc. The Dean's office reported that all of the paperwork associated with minimum standards for fraternities was greatly facilitated by the use of the Macintosh.

2. More of the students who purchased a Macintosh believed that they made the correct decision than those students who did not purchase a Macintosh. While most people are biased to believe that they make correct choices, this difference argues that students overall believe that buying a Macintosh was wiser than not buying one.

3. Over 55% of the students felt that the Macintoshes had improved the quality of the curriculum. About 25% claimed that they had had some Macintosh assignment (other than word processing) in their courses. This percentage should grow over the next few years. About half of the students felt that their grades would suffer without a Macintosh (although the objective data argue mildly against this latter point).

4. Students spend 50-75% of their Macintosh time doing word processing and roughly spend about 60% of their Macintosh time using the Macintosh as a stand-alone computer and 40% using it as a terminal to the network.

5. Most of the students reported working in the evening or at night on their computers and reported doing most of their computing in their rooms. Other times and other places were fairly distant seconds.

6. Students were not concerned about printer noise or other computer related problems with their living spaces.

7. The vast majority of the students reported that they spent 25% of their time or less using the computer for non-academic purposes. The students, then, don't appear to be spending much of their time playing computer games.

In collecting data for this section, we interviewed several student groups including the undergraduate advisors and members of the interfraternity council. We also talked at some length with the office of residential life. Based on the various discussions, we surveyed 400 randomly chosen students. Fifty students who purchased Macintoshes and 50 students who did not were chosen from

each class. There was about a 50% return rate that was quite balanced across class, sex and Macintosh ownership. The results of the survey were somewhat different than expected from our earlier discussions. We expected more concern about printer noise and other forms of disruption caused by the addition of the computer to the living spaces, but there was little evidence for these concerns in the results of the survey. We had also heard reports of computer recluses; people whose academic performance was suffering because they stayed in their rooms for very long periods playing computer games. These claims are difficult to verify but 23% of the people surveyed claimed to know such people. This is, perhaps, an area that bears some watching. A copy of the survey and tables of the results appear in Appendix A.

Impact of the Macintosh on the Curriculum

During the four quarters of the academic year 84/85, five programs written at Dartmouth for the Macintosh were used in at least nine courses. Several other courses made use of commercially available software, particularly for word processing. The courses making specific use of the Macintosh spanned a wide variety of disciplines including: music, math, psychology, sociology, chemistry, spanish, and philosophy.

Our committee attempted to evaluate the impact of the Macintosh on those courses. There are several possible levels that such an evaluation could consider: At the very least one could ask whether the students and faculty felt that the programs were valuable. It would also be interesting to know if the instructor was able to do things with the use of the Macintosh that were previously not possible. Finally, and ideally, it would be nice to know if the use of the Macintosh improved learning in the course. We have something to say concerning the first question, a little bit about the second, and almost nothing about the final question.

Several characteristics of Dartmouth affect or possibly constrain the impact of the Macintosh on the curriculum. Dartmouth has had a rich computing environment for years. Many courses used computers in innovative ways long before the arrival of the Macintosh. Many, if not most, of the initial courses that made use of the Macintosh were just those courses that already had the students using the time-sharing system. For example, the students in Philosophy 10 had previously used a program, BERTIE, on time-sharing and now had the opportunity to use both BERTIE on time sharing and a related program VENN on the Macintosh. Students in Sociology 1 did some of lab exercises on the Macintosh (SOCSTAT) that had been done on IMPRESS previously. As a final example, the students in Psychology 10 (design and statistics) had used a statistical package MINITAB that was available on time sharing for their homework and projects. This past year the students used a statistical package for the Macintosh called WORMSTAT. The flavor of many of these courses, then, changed relatively little

with the introduction of the Macintosh. It would be unlikely to see a major improvement in the learning in such courses.

Main findings to date

1. The students who took advantage of the Macintosh programs in various courses rated those programs highly and thought that they were helpful in learning the material. Two examples help illustrate this point. In Sociology 1, Winter 85, the students did some of the lab assignments using IMPRESS, a time-sharing program, and some assignments using SOCSTAT, a Macintosh program written specifically for the course. At the end of the term the students rated both programs on a five-point scale with 1 indicating excellence. IMPRESS was rated 2.16 and SOCSTAT was rated 1.52. This difference was highly significant on a chi-square test. In Psychology 10, the students used the program WORMSTAT for their projects and assignments. At the end of the term, they evaluated the package on a similar five-point scale. The mean rating was1.44 and over 60% of the students checked the highest possible category.

2. The majority of the faculty using specifically designed programs were pleased-to-excited with the experience. They felt that the program added to the course. Where relevant, these instructors felt that the Macintosh programs were superior to programs previously used on the time-sharing system. One of the most frequent comments was that it took far less class time to explain the programs since the Macintosh was easier to use. There were some exceptions to this general approval: one of the professors teaching Sociology 1 found the package SOCSTAT limited and one professor thought that the Spanish 1 Drill exercises were frustrating.

3. There were instances of professors being able to do things that were either not possible or very difficult prior to the Macintosh. The use of APPLETONES and MOZART in Music 3 allowed students with little or no background in music to compose musical pieces and receive immediate feedback on those compositions. The students in Organic Chemistry were able to visually observe the result of mixing various orbits using the program ORBITAL MIXING. Finally, several programs such as BINARY TREES were used in computer science courses to allow the students to see graphical representations of algorithms.

4. There is little or no empirical evidence that the use of the Macintosh led to superior learning in any of these courses. As mentioned earlier there are several more-or-less mundane explanations for this. Firstly, very few professors structured their courses in such a way that the possibility could even be tested. No one conducted anything approaching a controlled experiment with random assignment of

students to Macintosh vs non-Macintosh groups. Two courses had sufficient data to permit an analysis of degree of Macintosh use with performance in the course. In neither of these was the relationship significant. Finally, we looked at the grades in 24 introductory courses as a function of whether or not the student owned a Macintosh. It should be noted that ownership does not guarantee usage and most of these courses did not make specific use of the Macintosh. Nevertheless, in 21 of the courses, there was no difference at all. In the remaining three there was a hint of a statistical difference and in all three the higher grades were obtained by the non-owners. The data from these courses appear in Table 2.

5. The most pervasive use of the Macintosh in the curriculum was in the vast increase in the number of student papers that were done using word processing. Students spent about 75% of their computing time doing word processing. Students were enthusiastic about word processing and found it a real time saver. Faculty opinion was mixed. Most faculty agreed that the papers were generally neater and easier to read and often had fewer spelling errors. There were differing opinions about whether the quality of the papers had improved. Some felt that the ability to do editing easily had led to better papers. Others felt that it was to easy to make local changes without thinking about the implication of the changes for the paper as a whole and that this led to less integrated, choppy papers. One professor commented that the main impact of the Mac on writing was that students put off papers until 2 hours before their due instead of the night before they're due.

6. One minor aspect of the increased use of word processing is a large increase in the average length of papers that students are turning in. This was examined quantitatively in two courses that had assigned similar papers before and after the advent of the Macintosh. In both courses, the papers were approximately 50% longer after the Mac was introduced. These differences were statistically significant. It may be desirable for instructors to impose maximum page limits on some assignments to protect New England's trees.

Some further comments concerning our failure to find any significant influence of the Macintosh on the learning process are in order. As stated above, the data are messy and lacking in appropriate controls. More importantly, most of the courses used computing prior to the Macintosh. In addition, many of these courses are very rich in instructional aids and the Macintosh played only a modest role. An example might help to illustrate this point. Professor Blake wrote a series of four lessons for Spanish 1 using the program DRILL. These lessons were to serve as optional reviews for four of the quizes. Each lesson might have required anywhere from 30 minutes to 2 hours to complete. In this same course, taught according to the Rassias method, there were 5 regular lectures every week, 5 morning drill sessions every week, a 3 hour language lab each week, a textbook, a workbook, and a

TABLE 2

Mean Grades for MacIntosh Owners and Non-Owners

in 24 Introductory-Level Courses

Course	Term	MacOwners	Non-Owners	F-value	p-value
Anthropology 1	Spring	2.77	3.08	<1	ns
Chemistry 5	Winter	2.93	2.90	<1	ns
Comp Lit 1	Winter	3.44	3.43	<1	ns
Economics 1	Winter	2.61	2.62	<1	ns
Economics 1	Spring	2.91	2.81	<1	ns
Education 20	Spring	3.24	3.09	<1	ns
English 5	Winter	3.24	3.15	<1	ns
French 1	Winter	3.42	3.11	1.19	.29
French 1	Spring	3.11	3.00	<1	ns
Geography 1	Winter	3.08	2.98	<1	ns
Geography 1	Spring	3.17	3.10	<1	ns
Government 5	Winter	2.96	3.30	5.38	.02
Government 5	Spring	3.17	3.14	<1	ns
History 2	Spring	2.98	3.15	<1	ns
Mathematics 3	Winter	2.67	2.65	<1	ns
Music 3	Winter	2.83	2.96	<1	ns
Philosophy 1	Spring	3.13	3.33	2.64	.10
Physics 13	Winter	2.67	2.94	3.20	.07
Psychology 1	Winter	2.90	2.94	<1	ns
Psychology 1	Spring	2.91	2.92	<1	ns
Religion 1	Winter	3.17	3.13	<1	ns
Sociology 1	Spring	3.24	3.08	<1	ns
Visual Studies 10	Winter	3.92	3.94	<1	ns

lab manual, all in addition to the Macintosh exercises. It would be unreasonable to expect the Macintosh exercises to have much of an impact above and beyond these other experiences.

The introduction of the Macintoshes impacted the curriculum in several other ways not related to any specific software. Many faculty began preparing syllabi and handouts on the Macintosh and most people felt these documents were prepared in a more timely and thorough fashion. More professors reported preparing lecture notes for the students and one professor (Tom Roos) made those note available in a down-loadable form on the time-sharing system. Since many more students had terminal access to the time-sharing system, many professors (particularly in the math department) reported increased use of the electronic mail system.

Many more professors are planning to use the Macintosh in their courses during the current academic year. We would like to see a more systematic evaluation of the impact of the Macintosh in those courses. We would also like to see a systematic evaluation of the effect of the increased use of word processing.

Miscellaneous Impact

We set out to examine the impact of the Macintosh on the three areas covered above. In the process of exploring those areas, other areas of impact emerged. Two, in particular, seemed to us as important candidates for further study: the use of Macintoshes by the administration and staff, and the impact on the use of the central time-sharing system, especially D1.

Several people felt that the Macintoshes had at least as much impact on the daily lives of staff and administrators as it had on faculty and students. A great deal of office word processing was being shifted to the Macs, budgets were being kept on spreadsheets, and data were being stored on database packages. These new uses of computing could lead to changes in staffing patterns, that is, the number and types of staff in particular offices and could have a major bearing on the skills required for certain jobs and the type of training offered to the staff.

Impact on Kiewit. Toward the end of the 1984/85 academic year, the administrators at Kiewit noticed that the use of D1, the primary time-sharing computer, had dropped about 25% over the preceding year. It is an unusual event for computer use to decline on any machine so this drop caused consiserable interest. The initial feeling was that this decline in usage was probably the result of having issued over 1600 personal computers to the students. This, in fact, had been one of the arguments for the decision to encourage the buying of Macintoshes, namely, that it would relieve the overcrowded central system. We were very interested in studying this decline in more detail to make sure that it was the influx of personal computers that had led to the decline.

We examined the use of D1 by students as a function of Class, Mac ownership, race and sex. To our surprise we found that Mac owners used D1 almost twice as much as nonowners. In keeping with this finding, we found that the Class of 88 used D1 about twice as much as the other classes. We also examined the use of D1 by each of the classes in their frehman year. Once again the Class of 88 used D1 about twice as much as any of the other classes did in their freshman year.

This increase in use by Mac owners probably should not have been surprising. In addition to the Mac proving the students with a tool for doing computing it also provided each of the owners with a terminal to use D1 from their dorm rooms. Accoring to our survey, students are spending about 40% of their Mac time using it as a terminal. If this trend holds we may actually see an increase in student use of D1 once each class has become fully computerized.

This raises the interesting question about what did actually cause the real overall decline in the use of D1. There are several possibilities: a decline in the use of course accounts (U numbers) and/or a shift of faculty computing to personal computers or the VAXes. Accurately identifying the cause of the decline could be important for future hardware decisions.

Two other finding emerged from our study of D1 use. As with the purchase of Macintoshes, males use D1 about 50% more than females and blacks use D1 significantly less than whites or the other minority groups. Since females and blacks purchased fewer Macintoshes, the lower use of D1 could have been due to this factor. To check this, we analyzed D1 use as a function of race and sex for Mac owners and nonowners separately. The previous results were unaffected by this breakdown. Females and blacks of either category used D1 less than males or whites. Complete details on D1 use by class, sex, and race appear in Appendix B.

Dartmouth College HANOVER · NEW HAMPSHIRE · 03755

DARTMOUTH COLLEGE
COMPUTER USE SURVEY

You are being sent this questionnaire to help Dartmouth evaluate the Macintosh and other personal computers at Dartmouth College. You were randomly selected, by Hinman Box and by the fact that you are recorded as being on campus during the Spring 1985 term. Our intent is to get as complete a return as possible, so that we may better generalize from a random sample to the general student body. Therefore, we hope you will take the time to fill out this survey and return it.

Since you were selected by Hinman Box, this is not an "anonymous" survey. Our sole purpose in knowing whom we have sent the survey to is to best enable us to obtain as many returned surveys as possible. **All results, however, will be treated anonymously.**

This survey is being sponsored by the College of Arts and Sciences. Many of the questions were inspired by interviews with individual students and student groups. This included meetings with area coordinators and the inter-fraternity council.

In addition to this survey, faculty members are being interviewed as to whether or not they incorporate personal computing in their courses, and if so, how.

If you have any questions, please call Professor George Wolford, x2777, Dr. Chris Strenta, x2510, or Dr. Larry Levine, x2783.

INSTRUCTIONS ON HOW TO RETURN THIS QUESTIONNAIRE ARE PROVIDED AT THE END OF THE QUESTIONNAIRE

Name_____ Residence_____

Current major, if declared, or, major you would be most likely to choose now:

_____

Computer experience prior to and while at Dartmouth:

1. I owned or had the exclusive use of a personal computer prior to Dartmouth:

   Y _____ N _____

Please use these definitions for questions two and four:

Novice: Someone who has never used any type of computer.

Beginner: Someone who has used "canned programs" like a word-processor or a business spread-sheet program, but who cannot at all use a programming language (for example, BASIC or FORTRAN).

Intermediate: A Beginner who can use a programming language.

Expert: Someone who can program well, probably in more than one language, and who either knows a variety of canned programs, or feels they would have little difficulty in learning one.

2. Prior to coming to Dartmouth, I was a

   Novice _____ Beginner _____ Intermediate _____ Expert _____ .

3. If you did not check Novice, please list the programs you used, and/or the languages you programmed in:

   Programs:_____

   Languages:_____

4. At the moment, I am a

   Novice _____ Beginner _____ Intermediate _____ Expert _____ .

5. If you did not check Novice, please list the programs you use, and/or the languages you program in:

   Programs:_____

   Languages:_____

6. I currently plan to substantially increase my computing abilities while at Dartmouth. (Please circle the number that best applies to you.)

Not at all 0 1 2 3 4 5 6 Very much

7. I currently anticipate a need for "computer literacy" in my career following Dartmouth.

Not at all 0 1 2 3 4 5 6 Very much

8. Do you own or while at Dartmouth have the exclusive use of a:

Mac_____ IBM-PC_____ Terminal_____ Modem_____ Printer_____

Other (specify) _____

None _____

9. During the Spring 1985 term, please give a rough estimate of the amount of time spent each week "computing". (Using a personal computer or spent logged onto Kiewit, using either a personal computer or terminal)

Using a personal computer just as a computer, NOT connected to Kiewit.
_____ hours/week.

Using a personal computer as a terminal; connected to Kiewit.
_____ hours/week.

10. Indicate the percent of time you spend using a personal computer for:

personal uses (games not included) _____
playing computer games (including "XYZ") _____
extracurricular (organizations, clubs, business, etc.) _____
course work -- word processing _____
course work -- writing a program _____
course work -- using already written programs _____
sum = 100%

11. Please list the programs, if any, you have used for course work.

_____

12. I've had courses that have **REQUIRED** my use of a personal computer (not including using a personal computer only as a terminal or wordprocessor).

Y _____ N _____ **(IF NO, PLEASE SKIP QUESTIONS 13 AND 14)**

13. The use of the personal computer in those courses definitely improved the quality of instruction.

Not at all 0 1 2 3 4 5 6 Very much

14. What comments do you have about these courses?

_____

_____

15. My overall Dartmouth experience would suffer without the availability of personal computers.

Y _____ N_____

16. My grades would suffer without the availability of personal computers.

Y _____ N _____

17. If you do compute, please allocate the percents of your time spent computing to the four periods below. (Otherwise, leave blank)

morning _____
afternoon _____
evening _____
late night _____
Total = 100%

18. If you do compute, please allocate percents of where you do.

own room _____
public area at Kiewit _____
public area _____
other (please specify) _____
Total = 100%

****

IF YOU DO NOT NOW OWN OR HAVE THE EXCLUSIVE USE OF A PERSONAL COMPUTER, PLEASE SKIP THE NEXT PAGE AND GO TO QUESTION 25 ON PAGE 4. THANK YOU.

****

19. Approximately, how many personal computer programs do you have.

_____

20. Please list the three that you use the most, in order of use.

(1)_____ (2)_____ (3)_____

21. Having a personal computer has influenced where I want to live (for example, not in a greek house due to the lack of the Kiewit network there, or in a particular hall because it does have the Kiewit network, or because a particular living area attracts those with strong computing interests.)

Not at all 0 1 2 3 4 5 6 Very much

22. If personal computers have influenced where you want to live, how have they? (Please check all that apply):

Avoided living in a greek house _____
Made attempt to locate in a room with hardwire _____
Locate in hall with compute rep. _____
Avoided a move to off-campus _____
Other (specify)_____

_____

23. When I have a problem with my personal computer, the services at Kiewit are excellent.

Not at all 0 1 2 3 4 5 6 Very much

24. I have had the following problems at least once with my personal computer: (check all that apply)

needed repairs _____
"bad" copy of a program _____
"floppy-disk" has gone bad _____
lost more than a few minutes of work _____
unable to use a program due to lack of info _____

Factors in your decision to buy or not to buy a personal computer.

25. Briefly, please share with us your reasons for purchasing or not purchasing a personal computer.

_____

_____

26. Cost was a major factor in my decision of whether or not to buy a personal computer.

Y _____ N _____

27. How convinced are you that you made the right choice in your decision to purchase a personal computer?

Not at all 0 1 2 3 4 5 6 Very much

28. Did the availability of computing resources iinfluence your decision to attend Dartmouth?

Not at all 0 1 2 3 4 5 6 Very much

29. Whether or not you own a personal computer, what do you think are the advantages of owning a personal computer?

_____

_____

30. Whether or not you own a personal computer, what do you think are the problems of owning a personal computer?

_____

_____

Questions about living with personal computers.

31. How has the wide-spread proliferation of personal computers at Dartmouth altered your social life? (Use back of page if you would like more space.)

_____

_____

32. Noise due to personal computers in my living area is a problem.

Not at all 0 1 2 3 4 5 6 Very much

33. The typical student's room at Dartmouth is well set up for students' computers.

Not at all 0 1 2 3 4 5 6 Very much

34. Many people, both at Dartmouth and elsewhere, would say that Dartmouth has a strong reputation for excellence in computing. Do you think that this reputation for computing is well deserved?

Not at all 0 1 2 3 4 5 6 Very much

35. Do you personally know another student in your residence whom you believe has a serious personality problem attributable to their use of personal computers?

Y _____ N _____

Support of personal computers at Dartmouth College

36. I had all the info and help I needed in deciding whether or not to purchase a personal computer:

Not at all 0 1 2 3 4 5 6 Very much

37. Dartmouth has left students to their own devices to learn how to use personal computers.

Not at all 0 1 2 3 4 5 6 Very much

Thank you for your time in filling out this questionnaire. Please re-fold and fasten it so that the return address is showing (Hinman Box 6121), and mail it at the most convenient Hinman Mail box. If you prefer, you may drop it off with Sandy Nelson, 25 Silsby. If you would like a written copy of the report based on this questionaire, then please place your name and Hinman Box below. If you will not have a Hinman Box after June, 1985, than give us your mailing address.

Do you have any additional comments?

Name _____ Hinman Box _____

Mailing Address: _____
(If necessary)

_____

_____

SAS 15:08 SATURDAY, OCTOBER 5, 1985 1

EXCLUSIVE USE OF COMPUTER PRIOR TO DART			
YES		NO	
N	PCTN	N	PCTN
25.00	20.00	100.00	80.00

SAS 14:05 SATURDAY, OCTOBER 5, 1985 2

EXPERIENCE LEVEL PRIOR TO DARTMOUTH	Responses	Percent	Mean value
NOVICE	58	30.052	1.00000
BEGINNER	40	20.725	2.00000
INTERMEDIATE	80	41.451	3.00000
EXPERT	15	7.772	4.00000
999	193	100.000	2.26943

SAS 14:42 MONDAY, OCTOBER 7, 1985 1

	SELF-REPORTED MAC OWNER			
	NO - NOT THIS COMPUTER		YES - THIS COMPUTER	
	N	PCTN	N	PCTN
PRESENT EXPERIENCE LEVEL				
NOVICE	.	.	3	2.36
BEGINNER	.	.	29	22.83
INTERMEDIATE	.	.	66	51.97
EXPERT	3	100.00	29	22.83
ALL	3	100.00	127	100.00

	DART. EXPERIENCE SUFFER W/OUT PERS COMP			
	YES		NO	
	N	PCTN	N	PCTN
PRESENT EXPERIENCE LEVEL				
NOVICE	1	0.78	5	8.20
BEGINNER	29	22.48	19	31.15
INTERMEDIATE	71	55.04	27	44.26
EXPERT	28	21.71	10	16.39
ALL	129	100.00	61	100.00

PRESENT EXPERIENCE LEVEL	Responses	Percent	Mean value
NOVICE	7	3.646	1.00000
BEGINNER	48	25.000	2.00000
INTERMEDIATE	99	51.562	3.00000
EXPERT	38	19.792	4.00000
999	192	100.000	2.87500

	PLANS TO INCREASE COMPUTING ABILITY			
	N	PCTN	MEAN	STD
PRESENT EXPERIENCE LEVEL				
NOVICE	6	3.17	3.17	2.04
BEGINNER	48	25.40	2.17	1.80
INTERMEDIATE	98	51.85	2.77	1.78
EXPERT	37	19.58	4.43	2.23
ALL	189	100.00	2.95	2.03

	QUALITY OF INSTRUCTION IMPROVED?			
	N	PCTN	MEAN	STD
PRESENT EXPERIENCE LEVEL				
NOVICE	2	2.82	1.50	0.71
BEGINNER	15	21.13	2.73	1.98
INTERMEDIATE	37	52.11	3.59	1.72
EXPERT	17	23.94	4.71	1.99
ALL	71	100.00	3.62	1.95

	MADE THE RIGHT CHOICE IN DECISION			
	N	PCTN	MEAN	STD
PRESENT EXPERIENCE LEVEL				
NOVICE	5	2.75	3.80	1.92
BEGINNER	46	25.27	4.39	1.47
INTERMEDIATE	95	52.20	4.87	1.35
EXPERT	36	19.78	4.86	1.55
ALL	182	100.00	4.72	1.45

	COMP RESOURCES INFLUENCE COLLEGE CHOICE			
	N	PCTN	MEAN	STD
PRESENT EXPERIENCE LEVEL				
NOVICE	7	3.68	1.57	1.81
BEGINNER	46	24.21	1.11	1.89
INTERMEDIATE	99	52.11	1.77	1.93
EXPERT	38	20.00	3.37	2.38
ALL	190	100.00	1.92	2.14

PLANS TO INCREASE COMPUTING ABILITY	Responses	Percent	Mean value
NOT AT ALL - 0	31	16.316	0.00000
DISAGREE STRONGLY	25	13.158	1.00000
DISAGREE SLIGHTLY	23	12.105	2.00000
NEUTRAL	34	17.895	3.00000
AGREE SLIGHTLY	28	14.737	4.00000
AGREE STRONGLY	19	10.000	5.00000
VERY MUCH - 6	30	15.789	6.00000
999	190	100.000	2.94737

VARIABLE	N	MEAN	STD DEV	SUM	MINIMUM	MAXIMUM
PLANMORE	190	2.94736842	2.02559506	560.000000	0	6.00000000
COMPLIT	193	3.84974093	1.76576602	743.000000	0	6.00000000

PEARSON CORRELATION COEFFICIENTS
/ PROB > |R| UNDER HO:RHO=0 / NUMBER OF OBSERVATIONS

	PLANMORE	COMPLIT
PLANMORE	1.00000	0.56473
PLANS TO INCREASE COMPUTING ABILITY	0.0000	0.0001
	190	190
COMPLIT	0.56473	1.00000
NEED FOR COMPUTER LITERACY IN CAREER	0.0001	0.0000
	190	193

SAS 14:06 SATURDAY, OCTOBER 5, 1985 4

NEED FOR COMPUTER LITERACY IN CAREER	Responses	Percent	Mean value
NOT AT ALL - 0	6	3.109	0.00000
DISAGREE STRONGLY	14	7.254	1.00000
DISAGREE SLIGHTLY	33	17.098	2.00000
NEUTRAL	25	12.953	3.00000
AGREE SLIGHTLY	35	18.135	4.00000
AGREE STRONGLY	32	16.580	5.00000
VERY MUCH - 6	48	24.870	6.00000
999	193	100.000	3.84974

SAS 15:08 SATURDAY, OCTOBER 5, 1985 2

SELF-REPORTED MAC OWNER			
NO - NOT THIS COMPUTER		YES - THIS COMPUTER	
N	PCTN	N	PCTN
3.00	2.40	122.00	97.60

	PLANS TO INCREASE COMPUTING ABILITY			
	N	PCTN	MEAN	STD
SELF-REPORTED MAC OWNER				
NO - NOT THIS COMPUTER	3	2.34	3.33	2.52
YES - THIS COMPUTER	125	97.66	3.18	1.99
ALL	128	100.00	3.19	2.00

	QUALITY OF INSTRUCTION IMPROVED?			
	N	PCTN	MEAN	STD
SELF-REPORTED MAC OWNER				
NO - NOT THIS COMPUTER	1	1.85	4.00	.
YES - THIS COMPUTER	53	98.15	3.87	1.93
ALL	54	100.00	3.87	1.91

	DART. EXPERIENCE SUFFER W/OUT PERS COMP			
	YES		NO	
	N	PCTN	N	PCTN
SELF-REPORTED MAC OWNER				
NO - NOT THIS COMPUTER	3	2.97	.	.
YES - THIS COMPUTER	98	97.03	30	100.00
ALL	101	100.00	30	100.00

	GRADES SUFFER WITHOUT PERS COMP?			
	YES		NO	
	N	PCTN	N	PCTN
SELF-REPORTED MAC OWNER				
NO - NOT THIS COMPUTER	1	1.47	2	3.23
YES - THIS COMPUTER	67	98.53	60	96.77
ALL	68	100.00	62	100.00

SAS 18:39 FRIDAY, OCTOBER 4,

	MADE THE RIGHT CHOICE IN DECISION			
	N	PCTN	MEAN	STD
SELF-REPORTED MAC OWNER				
NO - NOT THIS COMPUTER	3	2.33	4.33	0.58
YES - THIS COMPUTER	126	97.67	4.89	1.32
ALL	129	100.00	4.88	1.31

SAS 18:40 FRIDAY, OCTOBER 4,

	COMP RESOURCES INFLUENCE COLLEGE CHOICE			
	N	PCTN	MEAN	STD
SELF-REPORTED MAC OWNER				
NO - NOT THIS COMPUTER	3	2.29	3.67	3.21
YES - THIS COMPUTER	128	97.71	2.13	2.16
ALL	131	100.00	2.17	2.19

SAS 18:39 FRIDAY, OCTOBER 4,

	MADE THE RIGHT CHOICE IN DECISION			
	N	PCTN	MEAN	STD
SELF-REPORTED MAC OWNER				
NO - NOT THIS COMPUTER	3	2.33	4.33	0.58
YES - THIS COMPUTER	126	97.67	4.89	1.32
ALL	129	100.00	4.88	1.31

SAS 18:40 FRIDAY, OCTOBER 4,

	COMP RESOURCES INFLUENCE COLLEGE CHOICE			
	N	PCTN	MEAN	STD
SELF-REPORTED MAC OWNER				
NO - NOT THIS COMPUTER	3	2.29	3.67	3.21
YES - THIS COMPUTER	128	97.71	2.13	2.16
ALL	131	100.00	2.17	2.19

TABLE OF OWNMAC BY SEX

OWNMAC(OFFICIAL MAC OWNERSHIP)
SEX(SEX OF RESPONDENT)

FREQUENCY PERCENT ROW PCT COL PCT	FEMALE	MALE	TOTAL
1	38	64	102
	19.90	33.51	53.40
	37.25	62.75	
	44.71	60.38	
2	47	42	89
	24.61	21.99	46.60
	52.81	47.19	
	55.29	39.62	
TOTAL	85	106	191
	44.50	55.50	100.00

FREQUENCY MISSING = 2

OWNS IBM-PC			
NO - NOT THIS COMPUTER		YES - THIS COMPUTER	
N	PCTN	N	PCTN
121.00	96.80	4.00	3.20

OWNS OR HAS EXCLUSIVE USE OF A TERMINAL			
NO - NOT THIS COMPUTER		YES - THIS COMPUTER	
N	PCTN	N	PCTN
104.00	83.20	21.00	16.80

OWNS OR HAS EXCLUSIVE USE OF MODEM			
NO - NOT THIS COMPUTER		YES - THIS COMPUTER	
N	PCTN	N	PCTN
111.00	88.80	14.00	11.20

SELF-REPORTED PRINTER OWNER			
NO - NOT THIS COMPUTER		YES - THIS COMPUTER	
N	PCTN	N	PCTN
50.00	40.00	75.00	60.00

HRS/WK USING COMPUTER AS COMPUTER %TILE	Responses	Percent	Mean value
1ST Q (0-1)	50	27.174	1.00000
2ND Q (1.5-4)	53	28.804	2.00000
3RD Q (4.5-7.5)	39	21.196	3.00000
4TH Q (8-50)	42	22.826	4.00000
999	184	100.000	2.39674

HRS/WK USING COMP AS TERMINAL %TILE	Responses	Percent	Mean value
1ST Q (0)	60	34.682	1.00000
2ND Q (1)	44	25.434	2.00000
3RD Q (1.5-5)	42	24.277	3.00000
4TH Q (6-50)	27	15.607	4.00000
999	173	100.000	2.20809

SAS 15:08 SATURDAY, OCTOBER 5, 1985 7

HAS TAKEN COURSE REQUIRING PERS COMP.			
YES		NO	
N	PCTN	N	PCTN
53.00	42.40	72.00	57.60

SAS 14:06 SATURDAY, OCTOBER 5, 1985 5

QUALITY OF INSTRUCTION IMPROVED?	Responses	Percent	Mean value
NOT AT ALL - 0	7	9.859	0.00000
DISAGREE STRONGLY	5	7.042	1.00000
DISAGREE SLIGHTLY	7	9.859	2.00000
NEUTRAL	14	19.718	3.00000
AGREE SLIGHTLY	11	15.493	4.00000
AGREE STRONGLY	10	14.085	5.00000
VERY MUCH - 6	17	23.944	6.00000
999	71	100.000	3.61972

SAS 15:08 SATURDAY, OCTOBER 5, 1985 8

DART EXPERIENCE SUFFER W/OUT PERS COMP			
YES		NO	
N	PCTN	N	PCTN
97.00	77.60	28.00	22.40

SAS 18:38 FRIDAY, OCTOBER 4,

	PLANS TO INCREASE COMPUTING ABILITY			
	N	PCTN	MEAN	STD
DART. EXPERIENCE SUFFER W/OUT PERS COMP				
YES	128	68.09	3.23	1.94
NO	60	31.91	2.30	2.08
ALL	188	100.00	2.93	2.02

SAS 18:39 FRIDAY, OCTOBER 4,

	QUALITY OF INSTRUCTION IMPROVED?			
	N	PCTN	MEAN	STD
DART. EXPERIENCE SUFFER W/OUT PERS COMP				
YES	55	77.46	3.93	1.85
NO	16	22.54	2.56	1.97
ALL	71	100.00	3.62	1.95

	GRADES BUFFER WITHOUT PERS COMP?			
	YES		NO	
	N	PCTN.	N	PCTN
EXPERIENCE ER W/OUT PERS				
	76	91.57	54	50.47
	7	8.43	53	49.53
	83	100.00	107	100.00

	COST WAS A MAJOR FACTOR IN DECISION			
	YES		NO	
	N	PCTN	N	PCTN
DART. EXPERIENCE SUFFER W/OUT PERS COMP				
YES	89	69.53	41	68.33
NO	39	30.47	19	31.67
ALL	128	100.00	60	100.00

SAS 18:39 FRIDAY, OCTOBER 4,

	MADE THE RIGHT CHOICE IN DECISION			
	N	PCTN	MEAN	STD
DART. EXPERIENCE SUFFER W/OUT PERS COMP				
YES	125	68.31	4.63	1.31
NO	58	31.69	4.48	1.70
ALL	183	100.00	4.72	1.45

SAS 18:40 FRIDAY, OCTOBER 4,

	COMP RESOURCES INFLUENCE COLLEGE CHOICE			
	N	PCTN	MEAN	STD
DART. EXPERIENCE SUFFER W/OUT PERS COMP				
YES	130	68.78	2.29	2.19
NO	59	31.22	1.15	1.82
ALL	189	100.00	1.94	2.14

SAS 15:08 SATURDAY, OCTOBER 5, 1985 5

GRADES SUFFER WITHOUT PERS COMP?			
YES		NO	
N	PCTN	N	PCTN
64.00	51.20	61.00	48.80

SAS 14:44 MONDAY, OCTOBER 7, 1985 7

	COST WAS A MAJOR FACTOR IN DECISION			
	YES		NO	
	N	PCTN	N	PCTN
GRADES SUFFER WITHOUT PERS COMP?				
YES	61	47.29	22	36.67
NO	68	52.71	38	63.33
ALL	129	100.00	60	100.00

SAS 14:06 SATURDAY, OCTOBER 5, 1985 6

NUMBER OF PERSONAL COMPUTER PROGRAMS	Responses	Percent	Mean value
0	7	5.738	0.0000
1	10	8.197	1.0000
2	21	17.213	2.0000
3	21	17.213	3.0000
4	8	6.557	4.0000
5	12	9.836	5.0000
6 OR MORE	43	35.246	28.1163
999	122	100.000	11.6066

SAS 14:07 SATURDAY, OCTOBER 5, 1985 7

HAVING PC HAS INFLUENCED HOUSING CHOICE	Responses	Percent	Mean value
NOT AT ALL - 0	105	80.769	0.00000
DISAGREE STRONGLY	10	7.692	1.00000
DISAGREE SLIGHTLY	6	4.615	2.00000
NEUTRAL	3	2.308	3.00000
AGREE SLIGHTLY	4	3.077	4.00000
AGREE STRONGLY	2	1.538	5.00000
999	130	100.000	0.43846

SERVICE AT KIEWIT IS EXCELLENT?	Responses	Percent	Mean value
NOT AT ALL - 0	4	4.545	0.00000
DISAGREE STRONGLY	12	13.636	1.00000
DISAGREE SLIGHTLY	11	12.500	2.00000
NEUTRAL	28	31.818	3.00000
AGREE SLIGHTLY	5	5.682	4.00000
AGREE STRONGLY	20	22.727	5.00000
VERY MUCH - 6	8	9.091	6.00000
999	88	100.000	3.25000

COST WAS A MAJOR FACTOR IN DECISION			
YES		NO	
N	PCTN	N	PCTN
63.00	66.40	42.00	33.60

TABLE OF COST BY OWNMAC

COST(COST WAS A MAJOR FACTOR IN DECISION)
OWNMAC(OFFICIAL MAC OWNERSHIP)

FREQUENCY / PERCENT / ROW PCT / COL PCT	1	2	TOTAL
YES	65	64	129
	34.57	34.04	68.62
	50.39	49.61	
	64.36	73.56	
NO	36	23	59
	19.15	12.23	31.38
	61.02	38.98	
	35.64	26.44	
TOTAL	101	87	188
	53.72	46.28	100.00

FREQUENCY MISSING = 5

MADE THE RIGHT CHOICE IN DECISION	Responses	Percent	Mean value
NOT AT ALL - 0	2	1.093	0.00000
DISAGREE STRONGLY	4	2.186	1.00000
DISAGREE SLIGHTLY	10	5.464	2.00000
NEUTRAL	23	12.568	3.00000
AGREE SLIGHTLY	24	13.115	4.00000
AGREE STRONGLY	45	24.590	5.00000
VERY MUCH - 6	75	40.984	6.00000
999	183	100.000	4.72131

COMP RESOURCES INFLUENCE COLLEGE CHOICE	Responses	Percent	Mean value
NOT AT ALL - 0	78	40.838	0.00000
DISAGREE STRONGLY	29	15.183	1.00000
DISAGREE SLIGHTLY	19	9.948	2.00000
NEUTRAL	14	7.330	3.00000
AGREE SLIGHTLY	16	8.377	4.00000
AGREE STRONGLY	16	8.377	5.00000
VERY MUCH - 6	19	9.948	6.00000
999	191	100.000	1.92147

NOISE OF PC IN LIVING AREA IS PROBLEM	Responses	Percent	Mean value
NOT AT ALL - 0	125	65.104	0.00000
DISAGREE STRONGLY	32	16.667	1.00000
DISAGREE SLIGHTLY	13	6.771	2.00000
NEUTRAL	9	4.687	3.00000
AGREE SLIGHTLY	7	3.646	4.00000
AGREE STRONGLY	4	2.083	5.00000
VERY MUCH - 6	2	1.042	6.00000
999	192	100.000	0.75521

STUDENT ROOM IS WELL SET UP FOR PC	Responses	Percent	Mean value
NOT AT ALL - 0	15	8.242	0.00000
DISAGREE STRONGLY	24	13.187	1.00000
DISAGREE SLIGHTLY	33	18.132	2.00000
NEUTRAL	50	27.473	3.00000
AGREE SLIGHTLY	22	12.088	4.00000
AGREE STRONGLY	27	14.835	5.00000
VERY MUCH - 6	11	6.044	6.00000
999	182	100.000	2.90659

SAS 14:08 SATURDAY, OCTOBER 5, 1985 13

DART REPUTATION IN COMPUTING IS DESERVED	Responses	Percent	Mean value
DISAGREE STRONGLY	4	2.174	1.00000
DISAGREE SLIGHTLY	3	1.630	2.00000
NEUTRAL	20	10.870	3.00000
AGREE SLIGHTLY	38	20.652	4.00000
AGREE STRONGLY	71	38.587	5.00000
VERY MUCH - 6	48	26.087	6.00000
999	184	100.000	4.70109

SAS 15:08 SATURDAY, OCTOBER 5, 1985 11

KNOW PEOPLE WITH PERSONALITY PROBLEMS			
YES		NO	
N	PCTN	N	PCTN
27.00	21.60	98.00	78.40

SAS 14:09 SATURDAY, OCTOBER 5, 1985 14

HAD ENOUGH INFO IN PURCHASE DECISION	Responses	Percent	Mean value
NOT AT ALL - 0	12	6.316	0.00000
DISAGREE STRONGLY	18	9.474	1.00000
DISAGREE SLIGHTLY	18	9.474	2.00000
NEUTRAL	39	20.526	3.00000
AGREE SLIGHTLY	32	16.842	4.00000
AGREE STRONGLY	40	21.053	5.00000
VERY MUCH - 6	31	16.316	6.00000
999	190	100.000	3.60526

SAS 14:09 SATURDAY, OCTOBER 5, 1985 15

STUDENTS LEARN PC USE ON THEIR OWN	Responses	Percent	Mean value
NOT AT ALL - 0	12	6.522	0.00000
DISAGREE STRONGLY	29	15.761	1.00000
DISAGREE SLIGHTLY	29	15.761	2.00000
NEUTRAL	46	25.000	3.00000
AGREE SLIGHTLY	23	12.500	4.00000
AGREE STRONGLY	24	13.043	5.00000
VERY MUCH - 6	21	11.413	6.00000
999	184	100.000	3.05978

TABLE OF CLASS2 BY OWNMAC

CLASS2(GRADUATION CLASS YEAR)
OWNMAC(OFFICIAL MAC OWNERSHIP)

FREQUENCY / PERCENT / ROW PCT / COL PCT	1	2	TOTAL
85	27	19	46
	14.14	9.95	24.08
	58.70	41.30	
	26.47	21.35	
86	21	23	44
	10.99	12.04	23.04
	47.73	52.27	
	20.59	25.84	
87	27	21	48
	14.14	10.99	25.13
	56.25	43.75	
	26.47	23.60	
88	27	26	53
	14.14	13.61	27.75
	50.94	49.06	
	26.47	29.21	
TOTAL	102	89	191
	53.40	46.60	100.00

FREQUENCY MISSING = 2

A-8A

TABLE OF CLASS2 BY SEX

CLASS2(GRADUATION CLASS YEAR)
SEX(SEX OF RESPONDENT)

FREQUENCY PERCENT ROW PCT COL PCT	FEMALE	MALE	TOTAL
85	20	26	46
	10.47	13.61	24.08
	43.48	56.52	
	23.53	24.53	
86	25	19	44
	13.09	9.95	23.04
	56.82	43.18	
	29.41	17.92	
87	19	29	48
	9.95	15.18	25.13
	39.58	60.42	
	22.35	27.36	
88	21	32	53
	10.99	16.75	27.75
	39.62	60.38	
	24.71	30.19	
TOTAL	85	106	191
	44.50	55.50	100.00

FREQUENCY MISSING = 2

TABLE OF CLASS2 BY RACE

CLASS2(GRADUATION CLASS YEAR) RACE(RACE OF RESPONDENT)

FREQUENCY / PERCENT / ROW PCT / COL PCT	WHITE	ORIENTAL	BLACK	OTHER	TOTAL
85	44	0	2	0	46
	23.04	0.00	1.05	0.00	24.08
	95.65	0.00	4.35	0.00	
	25.43	0.00	18.18	0.00	
86	41	0	2	1	44
	21.47	0.00	1.05	0.52	23.04
	93.18	0.00	4.55	2.27	
	23.70	0.00	18.18	50.00	
87	41	3	3	1	48
	21.47	1.57	1.57	0.52	25.13
	85.42	6.25	6.25	2.08	
	23.70	60.00	27.27	50.00	
88	47	2	4	0	53
	24.61	1.05	2.09	0.00	27.75
	88.68	3.77	7.55	0.00	
	27.17	40.00	36.36	0.00	
TOTAL	173	5	11	2	191
	90.58	2.62	5.76	1.05	100.00

FREQUENCY MISSING = 2

A-C

APPENDIX B

D1 Use as a function of race, sex and Mac ownership
(measured in Foreground CRUs)

	Macintosh Owners	Non-owners
Whites	756	400
Oriental	1284	835
Native American	859	453
Black	551	263
Hispanic	595	450
.....		
Females	551	301
Males	879	474

Appendix B

Concurrent Data

SAS 15:12 MONDAY, SEPTEMBER 30, 1985

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE	STD ERR OF MEA
CLASS=85						
DOLLARS	987	89.4621	168.2721	0.00000000	2268.100	5.356
CONNECT	987	32.2333	58.8290	0.00000000	808.380	1.872
FORCRU	987	525.2364	1471.3440	0.00000000	25362.940	46.833
BACCRU	987	49.0274	347.7004	0.00000000	8303.400	11.067
STORAGE	987	147008.1023	201661.5644	90.00000000	1408814.000	6418.958
CLASS=86						
DOLLARS	992	75.8408	165.9931	0.00000000	3118.310	5.270
CONNECT	992	28.6418	50.9439	0.00000000	676.270	1.617
FORCRU	992	482.9760	1807.5520	0.00000000	43024.420	57.389
BACCRU	992	22.1329	44.9238	0.00000000	541.630	1.426
STORAGE	992	110043.2712	165540.3901	4.00000000	1505980.000	5255.912
CLASS=87						
DOLLARS	1003	48.76762	119.0611	0.00000000	1968.890	3.759
CONNECT	1003	20.61900	55.0817	0.00000000	844.050	1.739
FORCRU	1003	285.09726	931.5270	0.00000000	17062.770	29.413
BACCRU	1003	7.81557	32.3117	0.00000000	694.130	1.020
STORAGE	1003	70188.26321	132279.2550	8.00000000	1887556.000	4176.776
CLASS=88						
DOLLARS	1006	114.81352	238.11074	0.00000000	2937.0200	7.507
CONNECT	1006	54.32300	99.12015	0.00000000	894.3900	3.125
FORCRU	1006	861.93366	2261.27777	0.00000000	32915.1400	71.294
BACCRU	1006	4.71422	23.86442	0.00000000	553.0800	0.752
STORAGE	1006	32260.13817	67538.74985	20.00000000	725621.0000	2129.384

SAS 15:00 WEDNESDAY, OCTOBER 2, 1985

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE	STD ERR OF MEA
DOLLARS	3876	66.02465	155.86702	0.00000000	2937.0200	2.5035
CONNECT	3876	30.68012	62.09115	0.00000000	894.3900	0.9973
FORCRU	3876	460.43629	1407.12169	0.00000000	32915.1400	22.6016
BACCRU	3876	8.96617	56.32675	0.00000000	1842.6000	0.9047
STORAGE	3876	23595.55728	50642.77339	15.00000000	731636.0000	813.4401

Longitudinal Data

SAS 15:00 WEDNESDAY, OCTOBER 2, 1985

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE	STD ERR OF MEA
CLASS=85 1981-82 Academic Year						
DOLLARS	936	44.432094	109.94527	0.00000000	1494.6000	3.5936
CONNECT	936	20.641752	38.44578	0.01000000	465.1100	1.2566
FORCRU	936	295.655118	906.00213	0.00000000	12639.6100	29.6136
BACCRU	936	6.179786	58.20522	0.00000000	1345.9100	1.9024
STORAGE	936	7,123.622863	14337.30533	15.00000000	121790.0000	468.6294
CLASS=86 1982-83 Academic Year						
DOLLARS	955	37.73407	100.34784	0.00000000	1875.1300	3.2471
CONNECT	955	15.82817	32.29539	0.00000000	378.3800	1.045
FORCRU	955	237.84196	637.61624	0.00000000	8237.3600	20.6327
BACCRU	955	9.08134	80.39588	0.00000000	1842.6000	2.601
STORAGE	955	14077.00838	32312.30620	24.00000000	346022.0000	1045.601
CLASS=87 1983-84 Academic Year						
DOLLARS	978	64.12638	113.80395	0.00000000	1748.4600	3.639
CONNECT	978	30.47203	43.17283	0.00000000	611.2900	1.380
FORCRU	978	422.82434	1081.05704	0.00000000	22690.1200	34.5683
BACCRU	978	15.90329	48.68209	0.00000000	992.0800	1.5566
STORAGE	978	39527.61247	59487.29359	25.00000000	731636.0000	1902.193
CLASS=88 1984-85 Academic Year						
DOLLARS	1007	114.76809	237.99673	0.00000000	2937.0200	7.499
CONNECT	1007	54.29783	99.07409	0.00000000	894.3900	3.122
FORCRU	1007	861.22801	2260.26452	0.00000000	32915.1400	71.2269
BACCRU	1007	4.70954	23.85301	0.00000000	553.0800	0.7516
STORAGE	1007	32459.90169	67802.16261	20.00000000	725621.0000	2136.627

$ logout
CHRISS logged out at 2-OCT-1985 15:09:17.90

Kiewit Network, Dartmouth College, port 72/2 (type HELP for assistance)

Females

SEX=1

DOLLARS	1658	65.78603	144.1831	0.00000000	1968.890	3.540
CONNECT	1658	29.70655	64.8386	0.00000000	844.050	1.592
FORCRU	1658	388.08639	1144.8382	0.00000000	17062.770	28.115
BACCRU	1658	16.62340	60.2203	0.00000000	1446.450	1.478
STORAGE	1658	73639.40893	139985.0787	4.00000000	1505980.000	3437.870

SEX=2 Males

DOLLARS	2330	93.9383	200.3405	0.00000000	3118.310	4.150
CONNECT	2330	37.0400	73.2804	0.00000000	894.390	1.518
FORCRU	2330	646.8374	2000.1147	0.00000000	43024.420	41.435
BACCRU	2330	23.7621	225.0716	0.00000000	8303.400	4.662
STORAGE	2330	100866.2270	165168.6392	25.00000000	1887556.000	3421.760

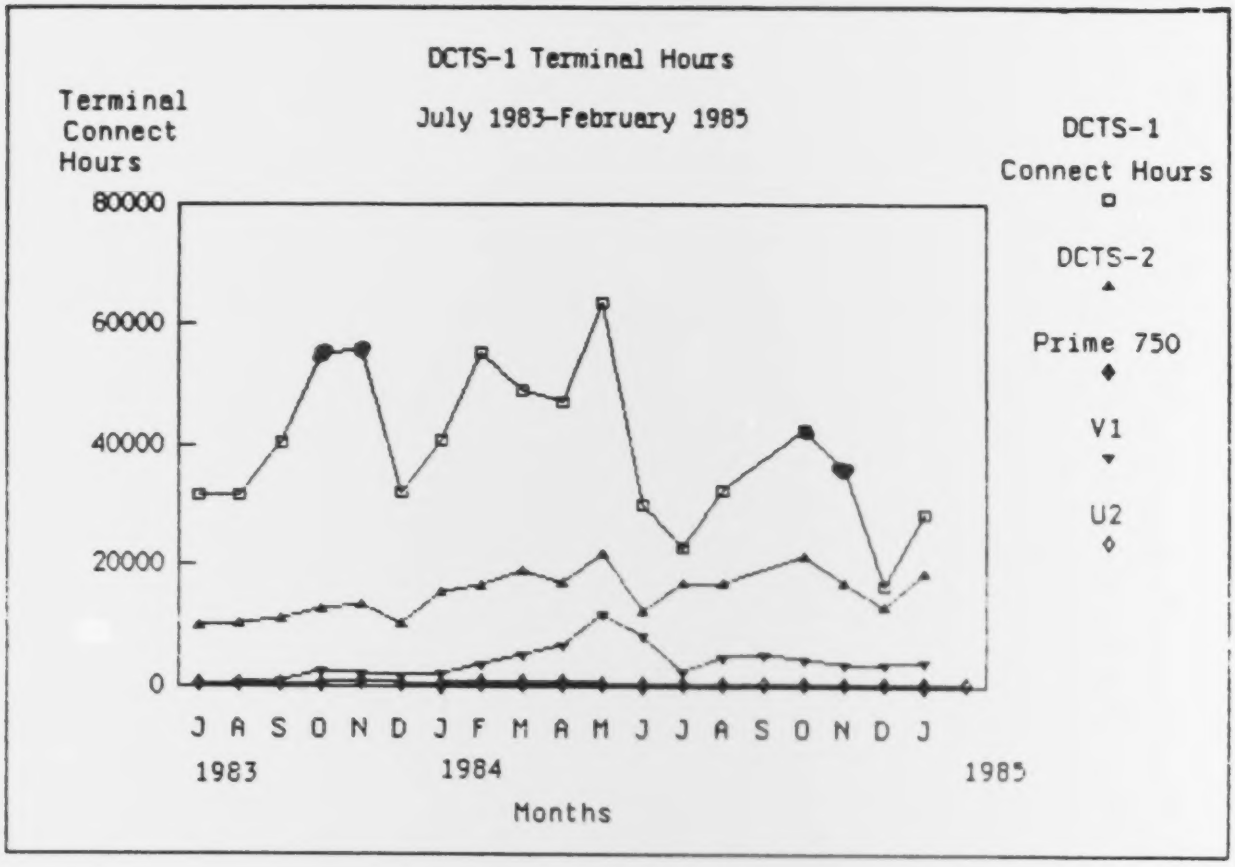
SAS 14:38 MONDAY, SEPTEMBER 30, 1985

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE	STD ERR OF MEA
DOLLARS	3988	82.23407	179.6607	0.00000000	3118.310	2.844
CONNECT	3988	33.99114	69.9797	0.00000000	894.390	1.108
FORCRU	3988	539.26238	1702.3036	0.00000000	43024.420	26.956
BACCRU	3988	20.79423	176.3828	0.00000000	8303.400	2.793
STORAGE	3988	89546.75251	155756.5822	4.00000000	1887556.000	2466.430

SAS 14:40 MONDAY, SEPTEMBER 30, 1985

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE	STD ERR OF MEA
MAC=1 owners						
DOLLARS	1569	105.26677	224.9784	0.00000000	2937.020	5.679
CONNECT	1569	44.42450	89.5763	0.00000000	894.390	2.261
FORCRU	1569	758.99388	2139.5960	0.00000000	32915.140	54.015
BACCRU	1569	19.23792	270.6615	0.00000000	8303.400	6.833
STORAGE	1569	78291.68388	141969.3907	20.00000000	1406717.000	3584.125
MAC=2 Non-owners						
DOLLARS	2419	67.29472	140.8282	0.00000000	3118.310	2.863
CONNECT	2419	27.22390	52.4893	0.00000000	844.050	1.067
FORCRU	2419	396.74120	1325.8714	0.00000000	43024.420	26.957
BACCRU	2419	21.80367	61.5652	0.00000000	1446.450	1.251
STORAGE	2419	96846.96031	163696.2881	4.00000000	1887556.000	3328.287

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE	STD ERROR OF MEAN
RACE=1 White						
DOLLARS	3520	81.26495	183.6596	0.00000000	3118.310	3.09558
CONNECT	3520	32.75142	69.6942	0.00000000	894.390	1.17470
FORCRU	3520	541.52803	1765.3188	0.00000000	43024.420	29.75444
BACCRU	3520	21.16466	186.6286	0.00000000	8303.400	3.14562
STORAGE	3520	90136.65653	157269.6829	4.00000000	1887556.000	2650.77996
RACE=2 Oriental						
DOLLARS	88	145.2251	205.2675	0.05000000	1067.0200	21.8816
CONNECT	88	59.5600	85.7159	0.00000000	451.0900	9.1373
FORCRU	88	1059.4206	1833.1512	0.00000000	10617.6100	195.4146
BACCRU	88	25.3890	78.2187	0.00000000	541.6300	8.3381
STORAGE	88	115322.2386	160853.4274	25.00000000	816330.0000	17147.0330
RACE=3 Native Am.						
DOLLARS	43	108.70698	191.0077	0.00000000	1063.010	29.1284
CONNECT	43	57.48512	103.1276	0.00000000	517.150	15.7268
FORCRU	43	623.10674	1196.6045	0.00000000	6246.070	182.4805
BACCRU	43	17.31302	57.0990	0.00000000	351.780	8.7075
STORAGE	43	73529.51163	180187.5561	85.00000000	1012744.000	27478.3447
RACE=4 Black						
DOLLARS	289	69.29339	116.7945	0.00000000	1232.8700	6.87027
CONNECT	289	35.82429	61.7483	0.00000000	547.8000	3.63225
FORCRU	289	341.94398	794.0755	0.00000000	10199.1400	46.71032
BACCRU	289	16.56779	49.6542	0.00000000	528.7500	2.92083
STORAGE	289	78217.93426	135539.9440	56.00000000	921614.0000	7972.93789
RACE=5 Hispanic						
DOLLARS	48	92.01812	95.7692	0.0000000	405.1800	13.8231
CONNECT	48	45.94333	57.1813	0.0000000	219.3300	8.2534
FORCRU	48	532.40146	614.7027	0.0000000	2980.8900	88.7247
BACCRU	48	13.77062	41.7376	0.0000000	213.4400	6.0243
STORAGE	48	81589.77083	119450.0727	105.0000000	656733.0000	17241.1329


DCTS-1 Terminal Hours
July 1983-February 1985
Terminal Connect Hours
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Months
DCTS-1 Connect Hours
DCTS-2
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